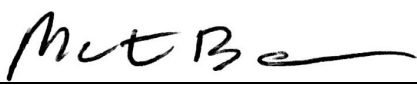
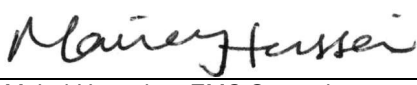




# Test Report



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS

Report No	EK0419-2
Client	ATEK Products, LLC
Address	210 NE 10 <sup>th</sup> Ave. Brainerd, MN 56401
Phone	763.392.5897
Items tested	Tank Scan II Monitor
FCC ID	YCLTSM7
IC ID	8942A-TSM7
FRN	0017195009
Equipment Type	Digital Spread Spectrum
Equipment Code	DSS
Emission Designator	
FCC/IC Rule Parts	47 CFR 15.247, 47 CFR 15.249, RSS 210 issue 7 and RSS GEN issue 2
Test Dates	April 27-30, 2010
Results	As detailed within this report
Prepared by	 Matthew Burman- Test Engineer
Authorized by	 Mairaj Hussain – EMC Supervisor
Issue Date	<u>May 28, 2010</u>
Conditions of Issue	This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 27 of this report.

Curtis-Straus LLC is accredited by the American Association for Laboratory Accreditation for the specific scope of accreditation under Certificate Number 1627-01. This report may contain data which is not covered by the A2LA accreditation.



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## Contents

Contents.....	2
Summary.....	3
Test Methodology.....	3
Product Tested - Configuration Documentation .....	5
<i>Statement of Conformity</i> .....	6
Test Results .....	7
<i>Bandwidth</i> .....	7
<i>Peak Power</i> .....	9
<i>Fundamental Field Strength</i> .....	11
<i>Harmonic Field Strength</i> .....	12
Band Edge Measurements.....	13
<i>Frequency Hopping Timing Requirements</i> .....	15
<i>Frequency Hopping Channel Separation</i> .....	17
<i>Radiated Spurious Emissions</i> .....	18
<i>Conducted Spurious Emissions</i> .....	20
<i>Occupied Bandwidth</i> .....	22
Measurement Uncertainty.....	24
Test Equipment Used.....	25
Product Documentation .....	26
Conditions Of Testing .....	27

Form Final Report REV 7-20-07 (DW)



## Summary

This test report supports an application for certification of a transmitter operating pursuant to 47 CFR 15.247, 47 CFR 15.249 and RSS-210. The product is the Tank Scan II Monitor. It is a transmitter that operates in the range 902-928MHz

We found that the product met the above requirements without modifications. Brad Cole from ATEK Products, LLC was present during the testing. The test sample was received in good condition.

The EUT has two modes of operation, 15.247 frequency hopping and 15.249. When the product is turned on, it initially operates under the frequency hopping mode and scans for the controller. If the controller is not found, it switches to 15.249 single frequency mode. While in single frequency mode, it radiates a transmission at 916.45MHz at 0dBm.

The digital circuitry was evaluated under report EK0419-4.

## Test Methodology

Radiated emission testing was performed according to the procedures specified in ANSI C63.4 (2009) and RSS-GEN. Radiated Emissions were maximized by rotating the device around three orthogonal axes as well as varying the test antenna's height and polarity. The device antenna cannot be maximized separately.

The product was tested with modulation on and peak readings were compared against the average limit presented in section CFR 15.249.

Conducted emission at the antenna port was performed, as required by rule section.

The EUT operates on battery power at 3.6Vdc. Testing was performed with a new battery.

The following bandwidths were used during radiated spurious and line conducted emissions.

Frequency	RBW	VBW
0.15-30MHz	9kHz	30kHz
30-1000MHz	120kHz	1MHz
1-25GHz	1MHz	3MHz

### Release Control Record

Issue No.	Reason for change	Date Issued
1	Original Release	July 12, 2010



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page 3 of 28

The low operating channel 0 is centered at 913MHz.  
The middle operating channel 29 is centered at 918MHz.  
The high operating channel 63 is centered at 926.6MHz.



**Product Tested - Configuration Documentation**

EUT Configuration										
Work Order: K0419 Company: Atek Products Company Address: 210 N.E. 10th Ave Brainerd, MN 56401 Contact: Brad Cole Person Present: Brad Cole										
<b>MN</b>			<b>PN</b>			<b>SN</b>				
EUT: TS Series			TSM7072			0006010				
EUT Description: Tank Scan II Monitor										
EUT Tx Frequency: 902-928MHz										
<b>Support Equipment:</b>			<b>MN</b>			<b>SN</b>				
Dell desktop PC			MM8			ERWIX				
Dell Monitor			E773c			--				
Lenovo Mouse			M-UAE119			--				
Dell Keyboard			RT7D20			--				
<b>EUT Ports:</b>										
Port Label	Port Type	No. of ports	No. Populated	Cable Type	Shielded	Ferrites	Length	Max Length	In/Out NEBS Type	Unpopulated Reason
sensor	RS-232	1	1	DB-9	yes	none	3m	---	---	Diagnostic Only
<b>Software / Operating Mode Description:</b>										
EUT transmits the fluid level in a container to the Tank Scan II Controller which updates with appropriate levels.										



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VERITAS

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## Statement of Conformity

The Tank Scan II Monitor has been found to conform to the following parts of 47 CFR and RSS 210 as detailed below:

RSS-GEN	RSS 210	Part 15	Comments
5.3		15.15(b)	There are no controls accessible to the user that varies the output power.
5.2		15.19	The label is shown in the label exhibit.
7.1.5		15.21	Information to the user is shown in the instruction manual exhibit.
		15.27	No special accessories are required for compliance.
		15.31	The EUT was tested in accordance with the measurement standards in this section.
		15.33	Frequency range was investigated according to this section, unless noted in specific rule section under which the equipment operates.
		15.35	The EUT emissions were measured using the measurement detector and bandwidth specified in this section, unless noted in specific rule section under which the equipment operates.
7.1.4		15.203	The antenna for this device is hardwired to the PCB.
	2.6	15.205 15.209	The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209.
	A2.9 (a)	15.249 (a)	The fundamental and harmonics meet the limits in 15.249(a)
	A2.9 (b)	15.249 (d)	Spurious emissions meet the limits in 15.209.
	Annex 8	15.247	The unit complies with the requirements of 15.247
4.6.1	5.9.1		Occupied Bandwidth measurements were made.

## Test Results

### Bandwidth

#### LIMIT

If the 20dB bandwidth of the hopping channel is less than 250kHz, the system shall use at least 50 hopping frequencies... [15.247(a) (1)(i)]

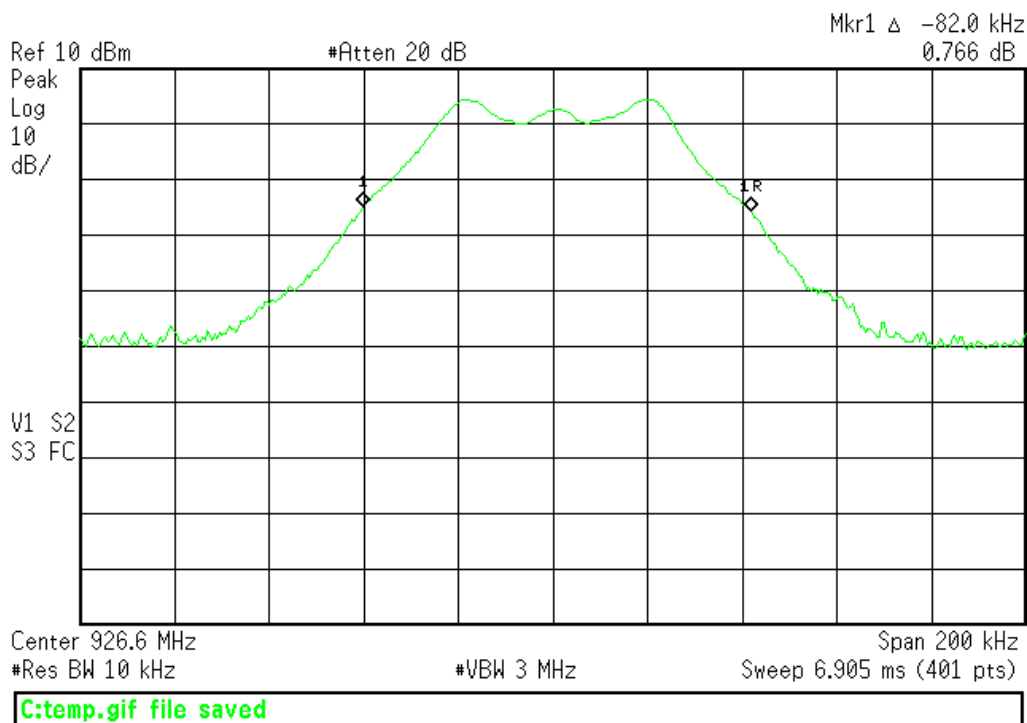
#### MEASUREMENTS / RESULTS

<b>20dB Bandwidth</b>	<b>K0419</b>
<b>Engineer:</b> MRB	<b>ATEK Products, LLC</b>
<b>Site:</b> 3m Indoor OATS	<b>Tank Scan II Monitor</b>
<b>Spectrum Analyzer:</b> Gold	
<b>Cable:</b> EMIR-High-21	
<b>RBW:</b> 10kHz	
<b>VBW:</b> 3MHz	
<b>Channel 0:</b> 82kHz	
<b>Channel 29:</b> 82kHz	
<b>Channel 63:</b> 82kHz	

#### Sample Analyzer Plot

Agilent 10:22:33 Apr 27, 2010

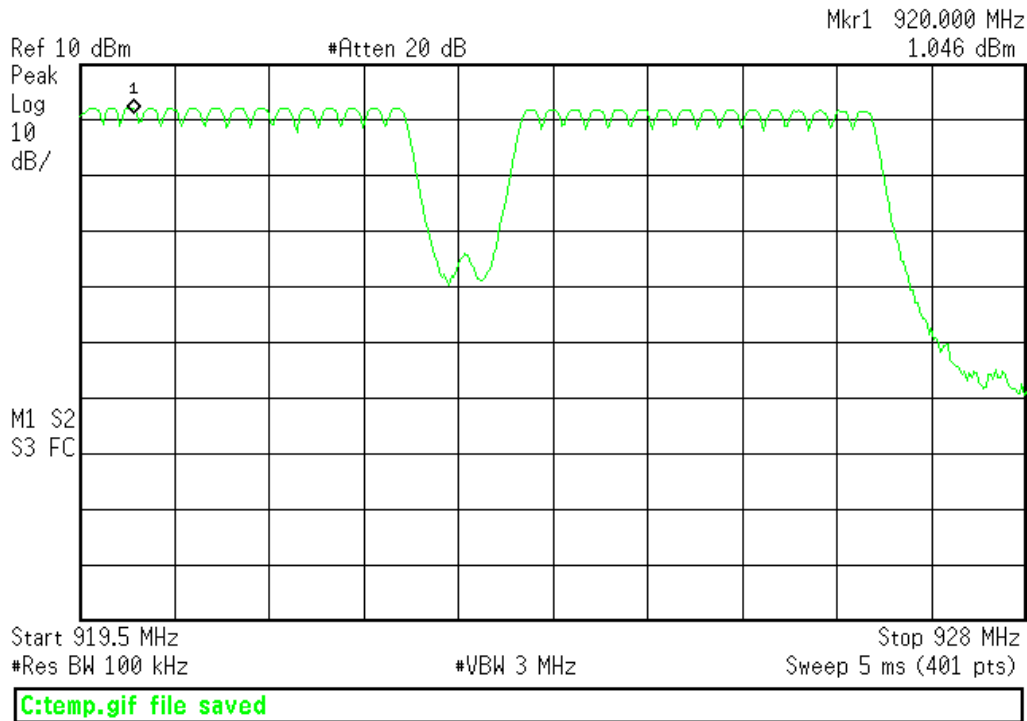
R T



# Number of hopping frequencies

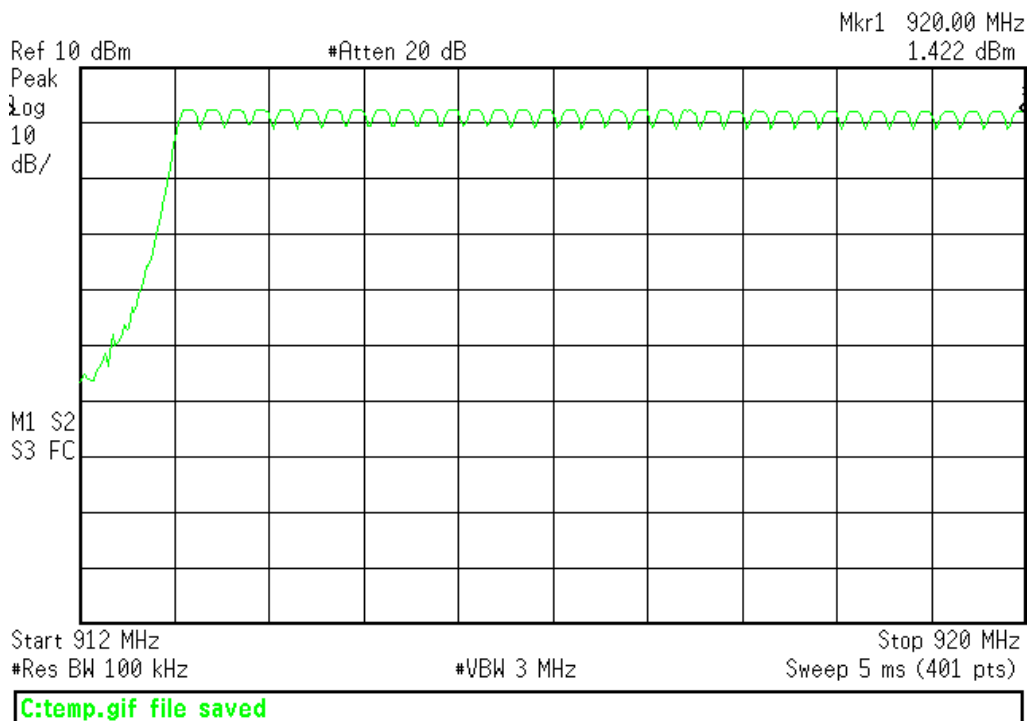
Agilent 10:07:55 Apr 27, 2010

R T



Agilent 10:04:22 Apr 27, 2010

R T



The system employs 64 hopping frequencies



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**Peak Power****LIMIT**

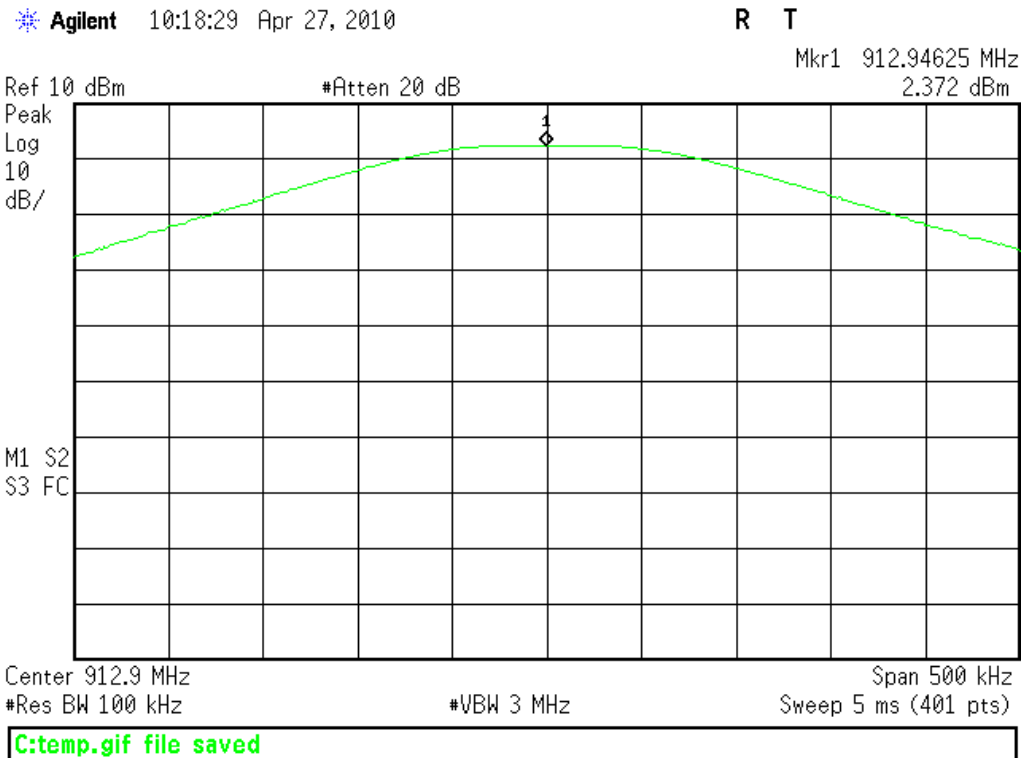
Conducted Output Power

1 Watt

[15.247(b) (3)]

**MEASUREMENTS / RESULTS**

Peak Output Power												
Date: 27-Apr-10			Company: Atek Products				Work Order: K0419					
Engineer: Matthew Burman			EUT Desc: Tank Scan II Monitor				EUT Operating Voltage/Frequency: Battery Powered					
Temp: 23.0°C			Humidity: 31%		Pressure: 998mBar							
Frequency Range: 902-928MHz							Measurement Distance: Conductive					
Notes:												
1 Watt = 30dBm												
Antenna Polarization (H/V)	Frequency (MHz)	Reading (dBm)			Cable Factor (dB)	Adjusted Reading (dBm)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBm)	Margin (dB)	Result (Pass/Fail)
Channel 0	912.94625	2.372	---	---	1.2	3.5720	---	---	---	30.0	-26.4	Pass
Channel 29	918.765	2.015	---	---	1.2	3.2150	---	---	---	30.0	-26.8	Pass
Channel 63	926.525	1.442	---	---	1.2	2.6420	---	---	---	30.0	-27.4	Pass
Table Result: Pass by -24.1 dB Worst Freq: 912.97125 MHz												
Test Site: EMC-2			Cable 1: EMIR-HIGH-13									
Analyzer: Gold												

**PLOTS****Channel 0**

## Channel 29

\* Agilent 10:19:44 Apr 27, 2010

R T

Mkr1 918.76500 MHz  
2.015 dBm

Ref 10 dBm

#Atten 20 dB

Peak  
Log  
10  
dB/M1 S2  
S3 FCCenter 918.8 MHz  
#Res BW 100 kHz

#VBW 3 MHz

Span 500 kHz  
Sweep 5 ms (401 pts)

C:\temp.gif file saved

## Channel 63

\* Agilent 10:20:41 Apr 27, 2010

R T

Mkr1 926.52500 MHz  
1.442 dBm

Ref 10 dBm

#Atten 20 dB

Peak  
Log  
10  
dB/M1 S2  
S3 FCCenter 926.5 MHz  
#Res BW 100 kHz

#VBW 3 MHz

Span 500 kHz  
Sweep 5 ms (401 pts)

C:\temp.gif file saved



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page 10 of 28

## Fundamental Field Strength

### Limit

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 - 928 MHz	50	500
2400 - 2483.5 MHz	50	500
5725 - 5875 MHz	50	500
24.0 - 24.25 GHz	250	2500

15.249(a)

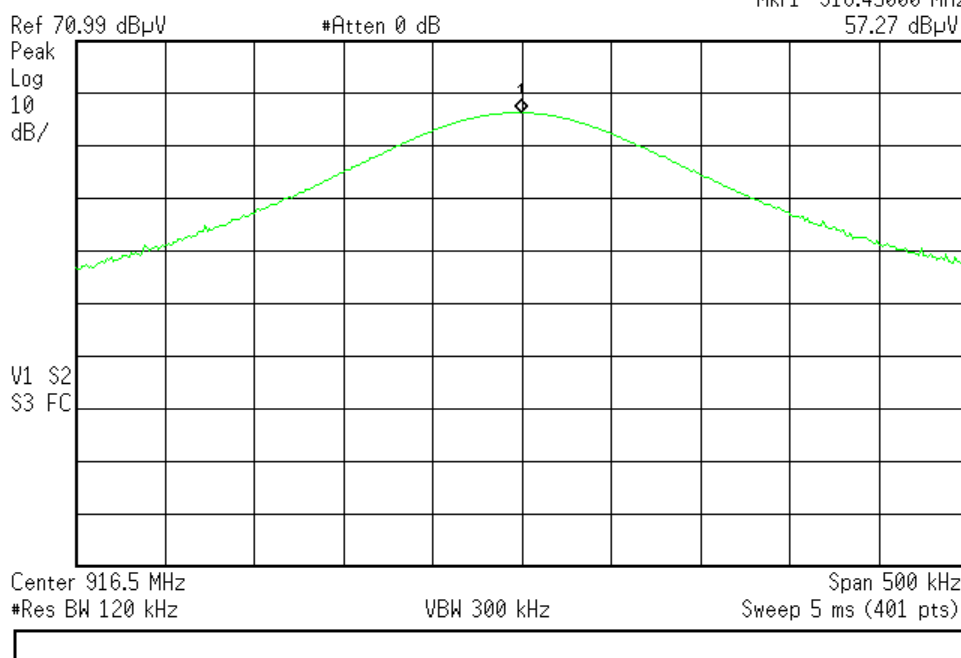
### Measurements/Results

Fundamental Field Strength												
Date: 28-Apr-10			Company: Atek Products						Work Order: K0419			
Engineer: Matthew Burman			EUT Desc: Tank Scan II Monitor						EUT Operating Voltage/Frequency: Battery Powered			
Temp: 21.4°C			Humidity: 32%			Pressure: 997mBar						
Frequency Range: 902-928MHz								Measurement Distance: 3 m				
Notes: Only operates at a single frequency								50 mV/m = 94dBuV/m				
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBuV/m)	---			FCC 15.249 (a)		
							Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)
v	916.45	57.3	0.0	21.9	6.2	85.4	---	---	---	93.97	-8.57	Pass
Table Result: Pass						by -8.6 dB		Worst Freq:			916.45 MHz	
Test Site: 1DCC-OATS-3M-I			Cable 1: EMIR-16			Cable 2: ---			Cable 3: ---			
Analyzer: Gold			Preamp: none			Antenna: Green			Preselector: ---			

### Plots

Agilent 09:06:01 Apr 28, 2010

R T

Mkr1 916.45000 MHz  
57.27 dBuV

## Harmonic Field Strength

### Limit

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 - 928 MHz	50	500
2400 - 2483.5 MHz	50	500
5725 - 5875 MHz	50	500
24.0 - 24.25 GHz	250	2500

### 15.249(a)

Field Strength of Harmonics															
Date: 28-Apr-10			Company: Atek Products						Work Order: K0419						
Engineer: Matthew Burman			EUT Desc: Tank Scan II Monitor						EUT Operating Voltage/Frequency: Battery Powered						
Temp: 21.4°C			Humidity: 32%						Pressure: 997mBar						
Frequency Range: 1-7GHz									Measurement Distance: 3 m						
Notes: No Duty Cycle Correction Factor															
Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBμV)	Average Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Filter Factor (dB)	Cable Factor (dB)	Adjusted Peak Reading (dBμV/m)	Adjusted Avg Reading (dBμV/m)	FCC 15.249 (a) - Peak			FCC 15.249 (a) - Average		
										Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
v	1832.9	32.99	33.0	21.3	27.6	1.4	1.5	42.2	42.2	74.0	-31.8	Pass	54.0	-11.8	Pass
v	2749.35	31.33	31.3	22.8	28.9	0.9	1.6	39.9	39.9	74.0	-34.1	Pass	54.0	-14.1	Pass
v	3665.8	33.3	33.3	21.9	31.9	1.9	1.8	47.0	47.0	74.0	-27.0	Pass	54.0	-6.9	Pass
v	4582.25	27.83	27.8	21.0	32.4	1.7	2.2	43.2	43.1	74.0	-30.8	Pass	54.0	-10.8	Pass
v	5498.7	32.08	32.1	20.6	34.2	1.0	2.3	49.0	49.0	74.0	-25.0	Pass	54.0	-5.0	Pass
v	6415.15	31.0	31.0	20.7	34.3	1.6	2.7	48.9	48.9	74.0	-25.1	Pass	54.0	-5.1	Pass
Table Result: Pass by -5.1 dB Worst Freq: 6415.15 MHz															
Test Site: 1DCC-OATS-3M-I			Cable 1: EMIR-HIGH-21						Filter: Asset #1288						
Analyzer: Gold			Preamp: Asset #1517						Antenna: Qrange Horn						

Field Stregh of Harmonics															
Date: 28-Apr-10			Company: Atek Products			Work Order: K0419									
Engineer: Matthew Burman			EUT Desc: Tank Scan II Monitor			EUT Operating Voltage/Frequency: Battery Powered									
Temp: 21.4°C			Humidity: 32%			Pressure: 997mBar									
Frequency Range: 7-10GHz										Measurement Distance: 1 m					
Notes: No Duty Cycle Correction Factor															
Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBμV)	Average Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Filter Factor (dB)	Cable Factor (dB)	Adjusted Peak Reading (dBμV/m)	Adjusted Avg Reading (dBμV/m)	FCC 15.249 (a) - Peak			FCC 15.249 (a) - Average		
										Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
v	7331.6	29.0	29.0	20.7	37.3	3.0	2.9	51.5	51.5	83.5	-32.0	Pass	63.5	-12.0	Pass
v	8248.05	29.0	29.0	20.7	37.6	2.0	3.1	51.0	51.0	83.5	-32.5	Pass	63.5	-12.5	Pass
v	9164.5	31.3	31.3	20.5	38.1	2.0	3.3	54.2	54.2	83.5	-29.3	Pass	63.5	-9.3	Pass
Table Result: Pass by -9.3 dB Worst Freq: 9164.5 MHz															
Test Site: 1DCC-OATS-3M-I			Cable 1: EMIR-HIGH-21						Filter: Asset #1288						
Analyzer: Gold			Preamp: Asset #1517						Antenna: Orange Horn						



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## Band Edge Measurements

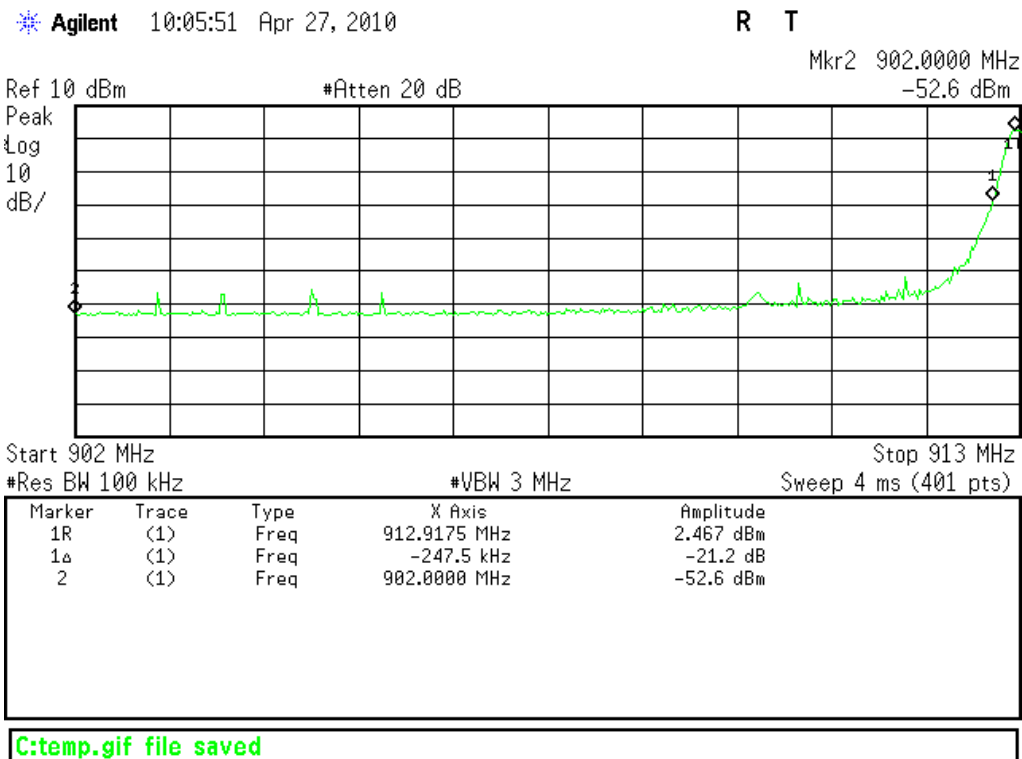
### LIMITS

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

[15.247(d)]

### PLOTS

#### 902MHz Band Edge

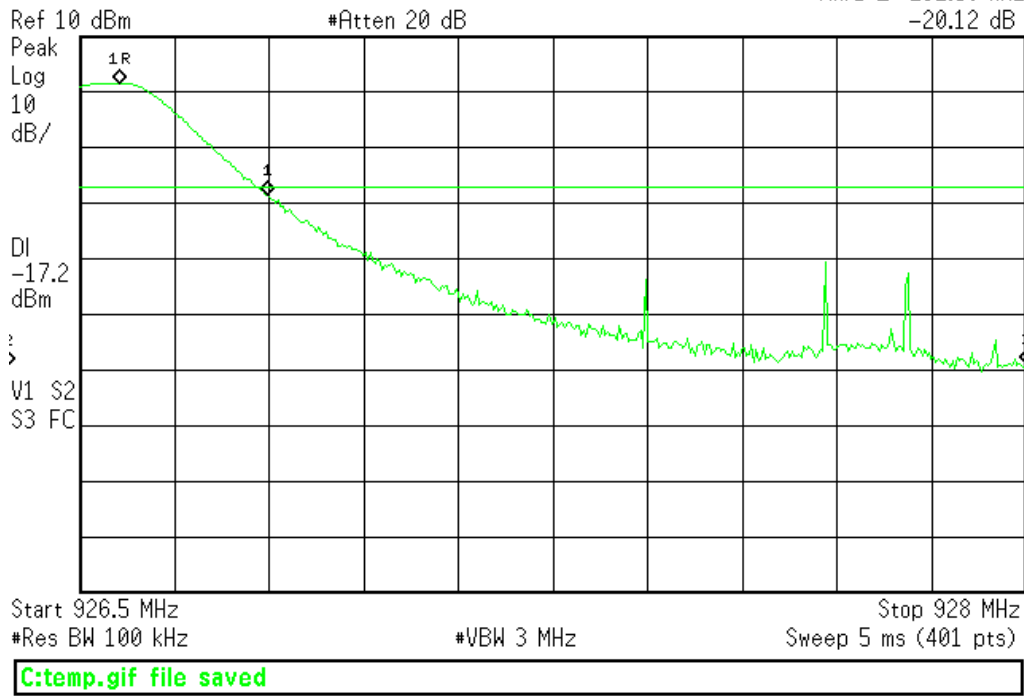


# 928MHz Band Edge

Agilent 10:10:15 Apr 27, 2010

R T

Mkr1  $\Delta$  232.50 kHz  
-20.12 dB



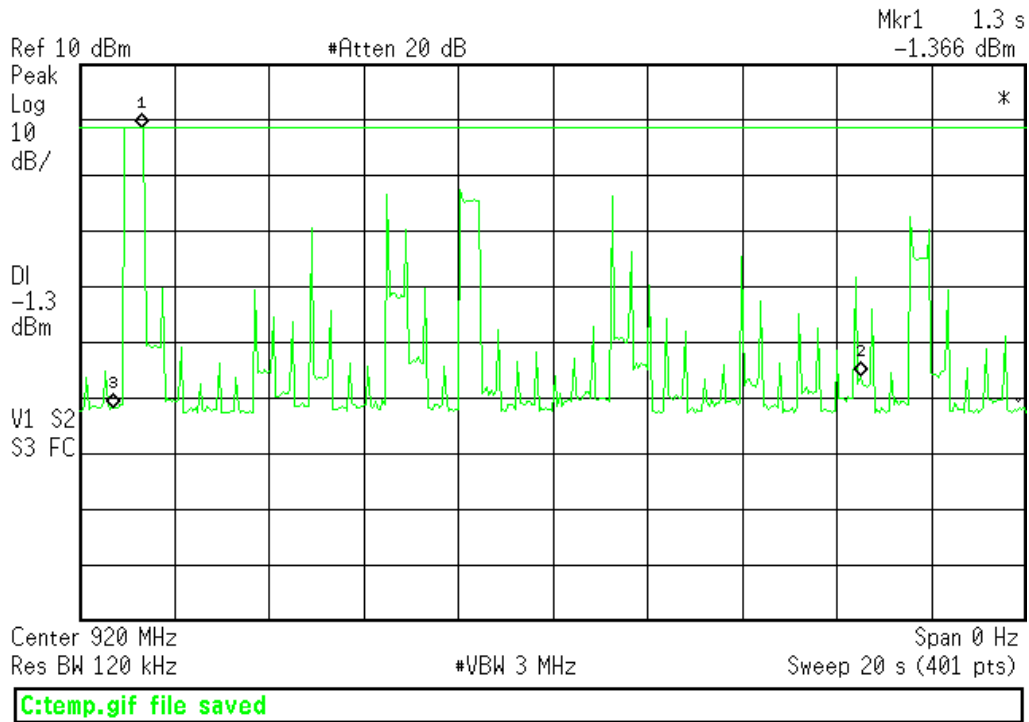
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Agilent 09:55:09 Apr 27, 2010

R T



20 second period

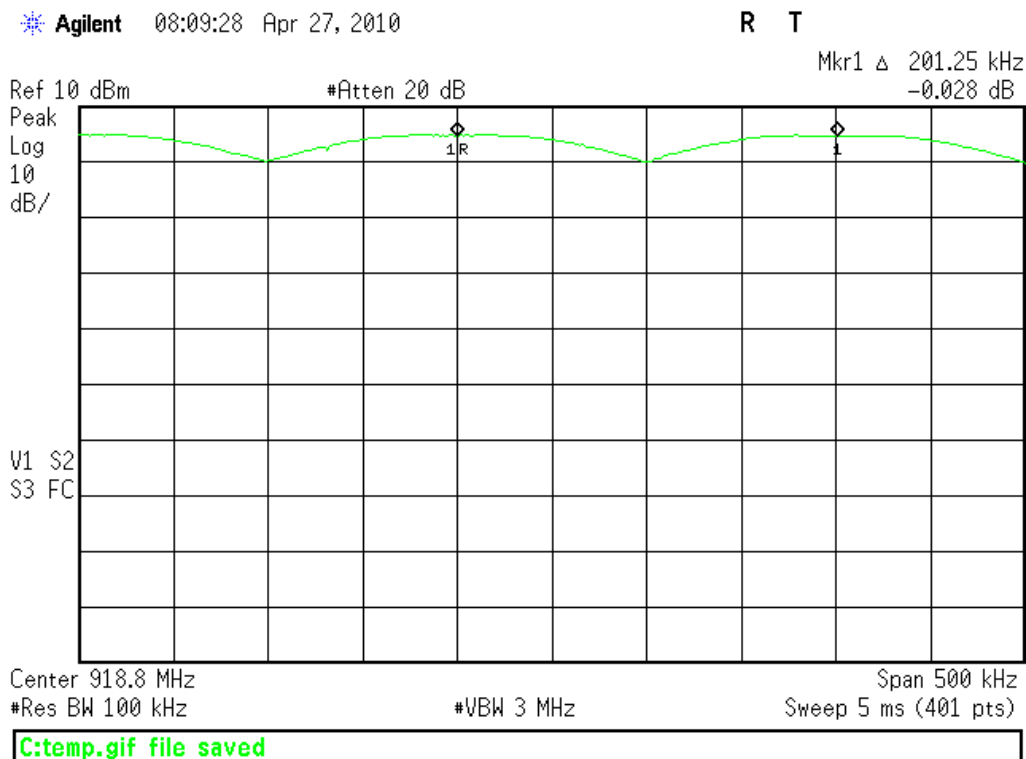
Within the 20 second period, only one transmission of 0.4 seconds occurs.



## Frequency Hopping Channel Separation

For frequency hopping systems operating in the 902-928MHz band: if the 20dB bandwidth of the hopping channel is less than 250kHz, the system shall use at least 50 hopping frequencies...

15.247 (a)(i)



The 20dB bandwidth measured is 81.5kHz

# Radiated Spurious Emissions

## LIMITS

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).  
[15.247(d)]

## MEASUREMENTS / RESULTS

Spurious Emissions												
Date: 28-Apr-10			Company: Atek Products				Work Order: K0419					
Engineer: Matthew Burman			EUT Desc: Tank Scan II Controller				EUT Operating Voltage/Frequency: Battery Powered					
Temp: 21.4°C			Humidity: 32%				Pressure: 997mBar					
Frequency Range: 30-1000MHz							Measurement Distance: 3 m					
Notes: Receive Mode							EUT Max Freq:					
No Emissions Found												
Antenna Polarization (H/V)	Frequency (MHz)	Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBuV/m)	CISPR Class B			FCC Class B		
							Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)
Noise Floor												
v	241.0	20.3	25.3	10.7	2.6	8.3	40.5	-32.2	Pass	43.5	-35.2	Pass
v	400.0	13.0	25.2	18.3	4.4	10.5	47.5	-37.0	Pass	46.0	-35.5	Pass
v	625.0	13.0	25.3	19.7	5.1	12.5	47.5	-35.0	Pass	46.0	-33.5	Pass
v	815.0	11.0	25.3	21.2	5.9	12.8	47.5	-34.7	Pass	46.0	-33.2	Pass
v	916.5	17.0	24.9	21.9	6.2	20.2	47.5	-27.3	Pass	46.0	-25.8	Pass
v	980.0	15.0	24.5	22.5	6.5	19.5	47.5	-28.0	Pass	54.0	-34.5	Pass
Table Result: Pass by -25.8 dB							Worst Freq: 916.5 MHz					
Test Site: 1DCC-OATS-3M-I			Cable 1: EMIR-16				Cable 2: ---			Cable 3: ---		
Analyzer: Gold			Preamp: Red-White				Antenna: Green			Preselector: ---		

Spurious Emissions												
Date: 28-Apr-10			Company: Atek Products				Work Order: K0419					
Engineer: Matthew Burman			EUT Desc: Tank Scan II Controller				EUT Operating Voltage/Frequency: Battery Powered					
Temp: 21.4°C			Humidity: 32%		Pressure: 997mBar							
Frequency Range: 30-1000MHz							Measurement Distance: 3 m					
Notes: No Duty Cycle Correction Factor Transmit Mode												
Antenna Polarization (H/V)	Frequency (MHz)	Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBuV/m)	CISPR Class B			FCC Class B		
							Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)
Noise Floor												
v	400.0	17.0	25.3	17.9	4.4	14.0	47.5	-33.5	Pass	46.0	-32.0	Pass
v	823.0	35.7	25.3	21.4	5.9	37.7	47.5	-9.8	Pass	46.0	-8.3	Pass
vbb	861.85	24.0	25.3	21.6	6.0	26.3	47.5	-21.2	Pass	46.0	-19.7	Pass
v	892.95	28.8	25.1	21.7	6.1	31.5	47.5	-16.0	Pass	46.0	-14.5	Pass
v	939.55	25.2	24.7	22.2	6.3	29.0	47.5	-18.5	Pass	46.0	-17.0	Pass
v	980.1	17.8	24.5	22.5	6.5	22.3	47.5	-25.2	Pass	54.0	-31.7	Pass
Table Result: Pass by -8.3 dB							Worst Freq: 823.0 MHz					
Test Site: 1DCC-OATS-3M-I			Cable 1: EMIR-16				Cable 2: ---			Cable 3: ---		
Analyzer: Gold			Preamp: Red-White				Antenna: Green			Preselector: ---		

Spurious Emissions																
Date: 28-Apr-10			Company: Atek Products						Work Order: K0419							
Engineer: Matthew Burman			EUT Desc: Tank Scan II Monitor						EUT Operating Voltage/Frequency: Battery Powered							
Temp: 21.4°C			Humidity: 32%						Pressure: 997mBar							
Frequency Range: 1-5GHz									Measurement Distance: 3 m							
Notes: No Duty Cycle Correction Factor																
Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Filter Factor (dB)	Cable Factor (dB)	Adjusted Peak Reading (dBuV/m)	Adjusted Avg Reading (dBuV/m)	FCC Class B High Frequency - Peak			FCC Class B High Frequency - Average			
										Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	
v	2749.35	35.83	35.8	22.8	28.9	0.9	1.6	44.4	44.4	74.0	-29.6	Pass	54.0	-9.5	Pass	
v	3665.8	35.1	35.1	21.9	31.9	1.9	1.8	48.8	48.8	74.0	-25.2	Pass	54.0	-5.1	Pass	
v	4582.25	28.3	28.3	21.0	32.4	1.7	2.2	43.6	43.6	74.0	-30.4	Pass	54.0	-10.3	Pass	
Table Result:				Pass		by -5.0		dB		Worst Freq: 5498.7 MHz						
Test Site: 1DCC-OATS-3M-I				Cable 1: EMIR-HIGH-21				Filter: Asset #1311					Antenna: Orange Horn			
Analyzer: Gold				Preamp: Asset #1517												

Spurious Emissions															
Date: 28-Apr-10			Company: Atek Products						Work Order: K0419						
Engineer: Matthew Burman			EUT Desc: Tank Scan II Monitor						EUT Operating Voltage/Frequency: Battery Powered						
Temp: 21.4°C			Humidity: 32%						Pressure: 997mBar						
Frequency Range: 5-10GHz									Measurement Distance: 1 m						
Notes: No Duty Cycle Correction Factor															
Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Filter Factor (dB)	Cable Factor (dB)	Adjusted Peak Reading (dBuV/m)	Adjusted Avg Reading (dBuV/m)	FCC Class B High Frequency - Peak			FCC Class B High Frequency - Average		
										Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBuV/m)	Margin (dB)	Result (Pass/Fail)
v	5500.575	44.6	44.6	20.6	34.9	0.3	2.3	61.5	61.5	83.5	-22.0	Pass	63.5	-2.0	Pass
v	7331.6	32.3	32.3	20.7	37.3	0.2	2.9	52.0	52.0	83.5	-31.5	Pass	63.5	-11.5	Pass
v	8248.05	29.0	29.0	20.7	37.6	0.3	3.1	49.3	49.3	83.5	-34.2	Pass	63.5	-14.2	Pass
v	9164.5	31.3	31.3	20.5	38.1	0.3	3.3	52.5	52.5	83.5	-31.0	Pass	63.5	-11.0	Pass
Table Result:				Pass		by -2.0		dB		Worst Freq:				5500.575 MHz	
Test Site: 1DCC-OATS-3M-I				Cable 1: EMIR-HIGH-21				Filter: Asset #1311				Antenna: Orange Horn			
Analyzer: Gold				Preamp: Asset #1517											



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Testing Cert. No. 1627-01

**Spurious Emissions**

Date: 28-Apr-10		Company: Atek Products		Work Order: K0419															
Engineer: Matthew Burman		EUT Desc: Tank Scan II Monitor		EUT Operating Voltage/Frequency: Battery Powered															
Temp: 21.4 °C		Humidity: 32%		Pressure: 997mBar															
Frequency Range: 1-10GHz				Measurement Distance: 1 m															
Notes: Receive Mode																			
Antenna Polarization (H / V)	Frequency (MHz)	Peak Reading (dBμV)	Average Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Filter Factor (dB)	Cable Factor (dB)	Adjusted Peak Reading (dBμV/m)	Adjusted Avg Reading (dBμV/m)	FCC Class B High Frequency - Peak			FCC Class B High Frequency - Average						
										Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)				
no emissions found																			
<b>Table Result:</b>		---		by		---		dB					<b>Worst Freq:</b>			---		MHz	
Test Site: 1DCC-OATS-3M-I				Cable 1: EMIR-HIGH-21				Filter: ---											
Analyzer: Gold				Preamp: Asset #1517				Antenna: Orange Horn											



## Conducted Spurious Emissions

### LIMITS

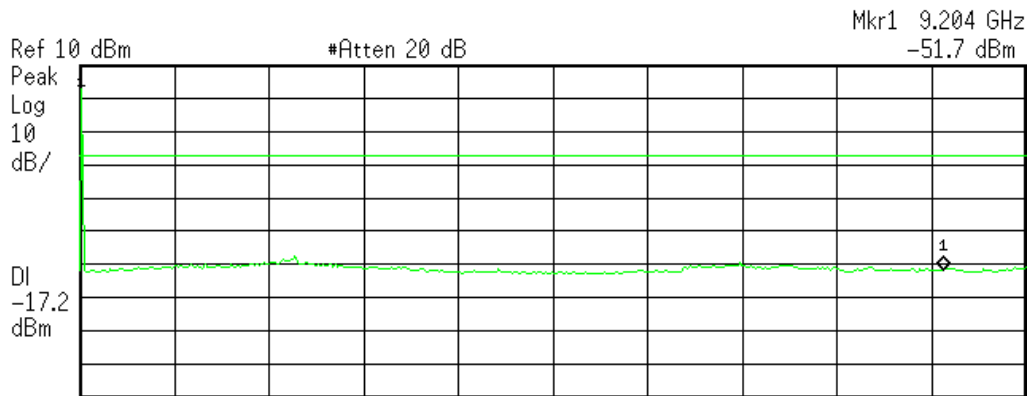
In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth that contains the highest level of desired power...

[15.247(d)]

### MEASUREMENTS / RESULTS

Agilent 10:12:49 Apr 27, 2010

R T

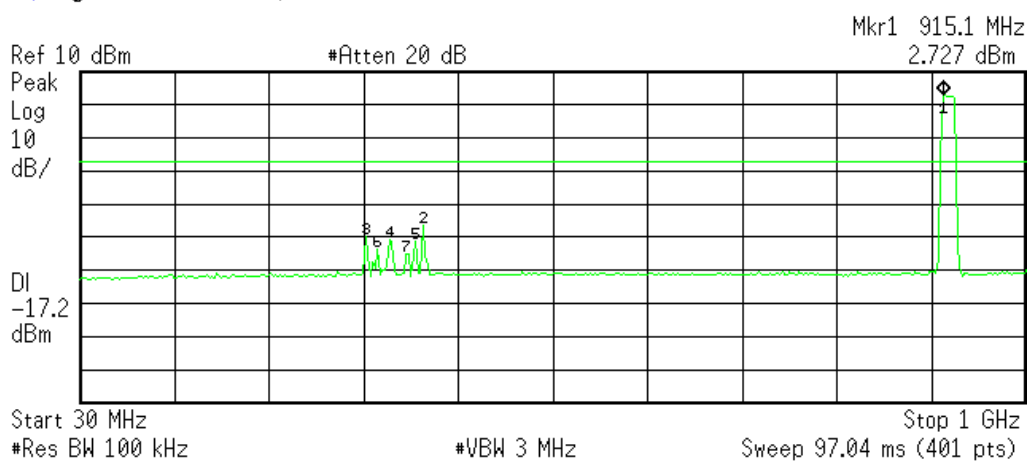


Start 900 MHz			Stop 10 GHz		
#Res BW 100 kHz			#VBW 3 MHz		
			Sweep 910.3 ms (401 pts)		
Pk	X Axis	Amplitude	Pk	X Axis	Amplitude
1	923 MHz	2.713 dBm	6		
2			7		
3			8		
4			9		
5			10		

C:\temp.gif file saved

\* Agilent 10:12:08 Apr 27, 2010

R T



Pk	X Axis	Amplitude		Pk	X Axis	Amplitude
1	915.1 MHz	2.727 dBm		6	335.6 MHz	-43.59 dBm
2	381.6 MHz	-36.38 dBm		7	364.7 MHz	-44.81 dBm
3	323.4 MHz	-39.54 dBm		8		
4	347.7 MHz	-40.92 dBm		9		
5	374.4 MHz	-41.21 dBm		10		

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## Occupied Bandwidth

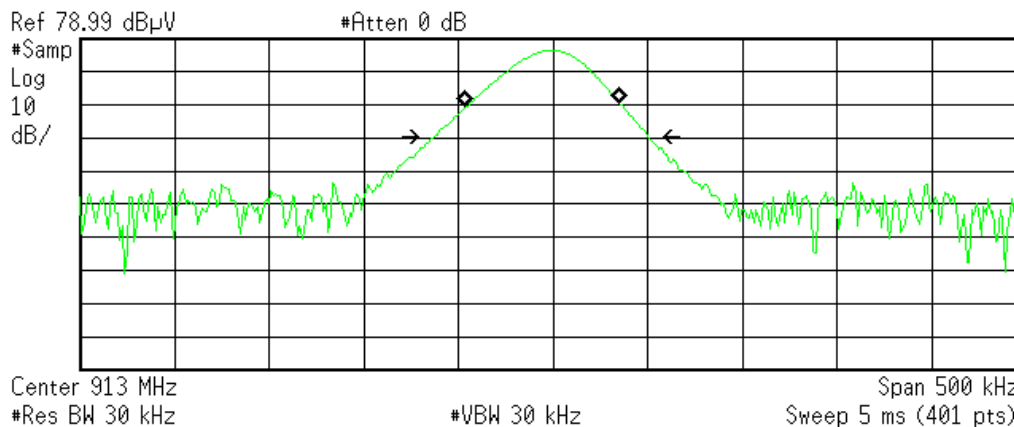
### REQUIREMENT

When an occupied bandwidth is no specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.  
[RSS-GEN 4.6.1]

Channel 0

Agilent 14:43:50 May 20, 2010

R T



Occupied Bandwidth

81.4766 kHz

Occ BW % Pwr 99.00 %

x dB -26.00 dB

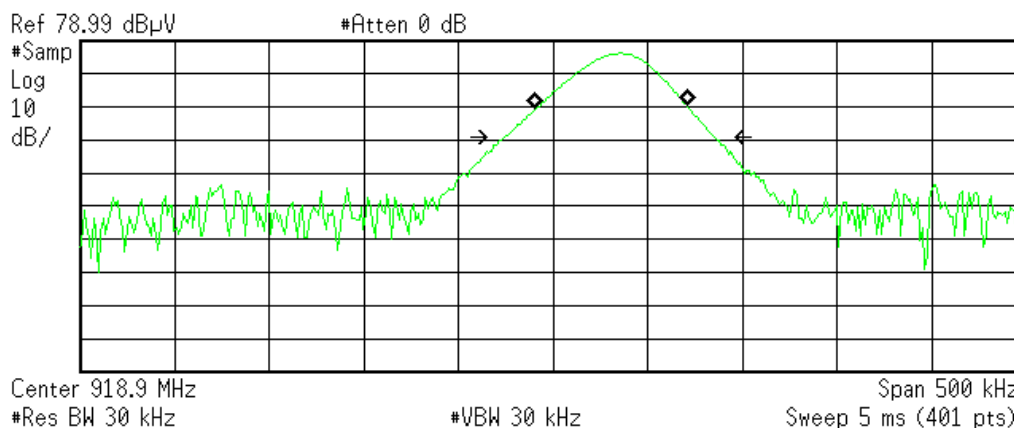
Transmit Freq Error -5.185 kHz  
x dB Bandwidth 113.291 kHz\*

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## Channel 29

\* Agilent 14:45:04 May 20, 2010

R T



Occupied Bandwidth  
81.5653 kHz

Occ BW % Pwr 99.00 %  
x dB -26.00 dB

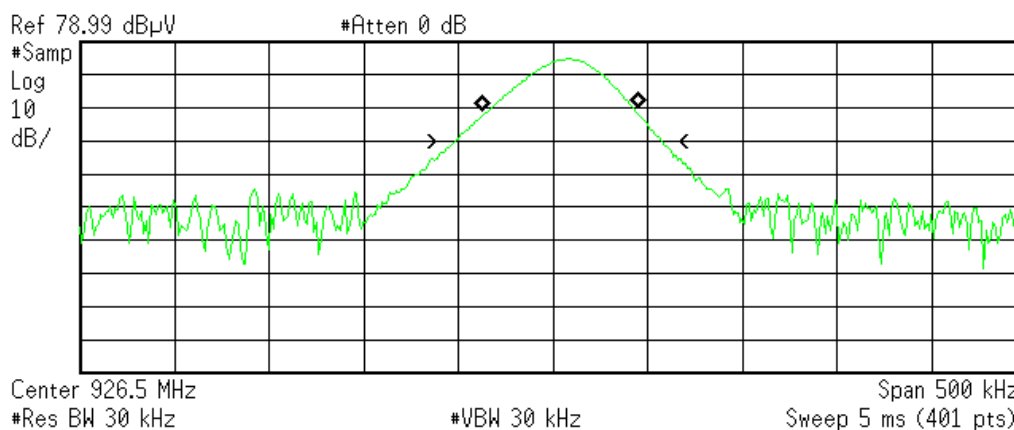
Transmit Freq Error 30.631 kHz  
x dB Bandwidth 113.599 kHz\*

C:\temp.gif file saved

## Channel 63

\* Agilent 14:46:28 May 20, 2010

R T



Occupied Bandwidth  
81.5685 kHz

Occ BW % Pwr 99.00 %  
x dB -26.00 dB

Transmit Freq Error 3.630 kHz  
x dB Bandwidth 112.919 kHz\*

C:\temp.gif file saved



## Measurement Uncertainty

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty
Radiated Emissions (30-1000MHz)		
NIST	5.6dB	N/A
CISPR	4.6dB	5.2dB (Ucisprr)
Radiated Emissions (1-26.5GHz)	4.6dB	N/A
Radiated Emissions (above 26.5GHz)	4.9dB	N/A
Magnetic Radiated Emissions	5.6dB	N/A
Conducted Emissions		
NIST	3.9dB	N/A
CISPR	3.6dB	3.6dB (Ucisprr)
Telco Conducted Emissions (Current)	2.9dB	N/A
Telco Conducted Emissions (Voltage)	4.4dB	N/A
Electrostatic Discharge	11.5%	N/A
Radiated RF Immunity (Uniform Field)	1.6dB	N/A
Electrical Fast Transients	23.1%	N/A
Surge	23.1%	N/A
Conducted RF Immunity	3dB	N/A
Magnetic Immunity	12.8%	N/A
Dips and Interrupts	2.3V	N/A
Harmonics	3.5%	N/A
Flicker	3.5%	N/A
Radio frequency (@ 2.4GHz)	$3.23 \times 10^{-8}$	$1 \times 10^{-7}$
RF power, conducted	0.40dB	0.75dB
Maximum frequency deviation:		
• Within 300Hz and 6kHz of audio frequency / Within 6kHz and 25kHz of audio frequency	3.4% 0.3dB	5% 3dB
Adjacent channel power	1.9dB	3dB
Conducted spurious emission of transmitter, valid up to 12.75GHz	2.39dB	3dB
Conducted emission of receivers	1.3dB	3dB
Radiated emission of transmitter, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of transmitter, valid up to 80GHz	3.3dB	6dB
Radiated emission of receiver, valid up to 26.5GHz	3.9dB	6dB
Radiated emission of receiver, valid up to 80GHz	3.3dB	6dB
Humidity	2.37%	5%
Temperature	0.7°C	1.0°C
Time	4.1%	10%
RF Power Density, Conducted	0.4dB	3dB
DC and low frequency voltages	1.3%	3%
Voltage (AC, <10kHz)	1.3%	2%
Voltage (DC)	0.62%	1%
The above reflects a 95% confidence level		



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## Test Equipment Used

Rev: 24-May-2010

Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Gold	100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I	9-Apr-2011
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code			Cat	Calibration Due
1DCC-OATS-3M-I	719150	2762A-8	R-3109			II	7-Jul-2011
Preamps / Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Red-White	0.009-2000MHz	ZFL-1000-LN	CS	N/A	1258	II	1-Mar-2011
1517 HF Preamp	1-18GHz	CS	CS	N/A	1517	II	29-May-2010
High Pass Filter	0.03-14.5 GHz	11SH10-3000/T9000-0/0	K&L	1	1311	II	22-Dec-2011
High Pass Filter	0.03-9 GHz	VHP-16	Mini-Circuits	NA	1288	II	22-Dec-2011
Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due
Green Bilog	30-2000MHz	CBL6112B	Chase	2742	620	I	17-Dec-2010
Orange Horn	1-18GHz	3115	EMCO	0004-6123	390	I	19-Jun-2011
Meteorological Meters		MN	Mfr	SN	Asset	Cat	Calibration Due
Temp./Humidity/Atm. Pressure Gauge		7400 Perception II	Davis	N/A	965	I	6-Apr-2011
1DCC-OATS-3M-I Thermohygrometer		35519-044	Control Company	72457635	1334	II	18-Aug-2011
EMC2 Thermohygrometer		35519-044	Control Company	72457653	1352	II	18-Aug-2011

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

***Product Documentation***

The following documentation has been provided by the client for inclusion in this report.



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## Conditions Of Testing

[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation], and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("Client"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "**Conditions**"):

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("**Test Report**") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.
2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.
3. The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.
5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "**BUREAU VERITAS**," "**BUREAU VERITAS CONSUMER PRODUCTS SERVICES**," "**BVCPS**," "**MTL**," "**ACTS**," "**MTL-ACTS**" and "**CURTIS-STRAUS**" (collectively, the "**Marks**") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.
6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.
7. The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
8. Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.
9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.
10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.
11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only where such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.
12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.



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13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.

14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.

15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B) NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.\$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

Rev.160009121(2)\_#684340 v13CS

